UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/731,176	12/09/2003	Paul J. Sidenblad	NVDA P000859	4860

26291   7590   08/27/2007
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EXAMINER
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ART UNIT	PAPER NUMBER
2112	

MAIL DATE	DELIVERY MODE
08/27/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	10/731,176	SIDENBLAD ET AL.
	Examiner	Art Unit	
	Sam Rizk	2112	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>30 July 2007</u>.

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1,3-6, 9,13-19,22,23 and 26-35</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) <u>13-15 and 35</u> is/are allowed.

6)☒ Claim(s) <u>1,3-5, 9,22 and 26-34</u> is/are rejected.

7)☒ Claim(s) <u>6 and 23</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>09 December 2003</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

- Response to the applicant's RCE dated 7/30/2007

- Claims 2, 7, 8, 10-12, 16-21, 24 and 25 have been Cancelled

- Claims 1, 3-6, 9, 13-19, 22, 23 and 26-35 have been submitted for examination

- Claims 1, 3-5, 9, 22 and 26-34 have been rejected

- Claims 6 and 23 are objected to

- Claims 13-15 and 35 are allowed

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1.   Claims 1, 3-5, 9, 13-19, 22, 23 and 35 rejected under 35 U.S.C. 102(e) as being anticipated by Aviani et al. US patent no. 6976085 (Hereinafter Aviani).

2.   In regard to claim Aviani teaches:

- (Currently Amended):A method of processing inbound and outbound frames using an offload unit [[and]] having a delegated connection table, comprising:

- initializing an entry in the delegated connection table with connection

  state data including a connection table index corresponding to a

  connection selected by a TCP stack executed by a host CPU for

  processing by the offload unit, a sequence number, and an

  acknowledgement number;

(Note: col. 14, lines (33-40) in Aviani)

- receiving an outbound frame having a prototype header and data for

  transmission from the TCP stack;

(Note: col. 14, lines (40-50) in Aviani)

- segmenting the data in the outbound frame into a plurality of data

  segments; and for each data segment, computing a TCP checksum,

  determining a transmit sequence number and a transmit

  acknowledgement number, updating a sequence number and an

  acknowledgement number stored in the delegated connection table,

  and outputting a frame including the TCP checksum, the transmit

  sequence number, the transmit acknowledgement number, and the

  data segment for data transmission over the selected connection.

(Note: FIG. 3, reference character (142) and col. 14, lines (54-67) through

col. 15, lines (1-38) in Aviani)

3.   In regard to claim 3, Aviani teaches:

- The method of claim 1, wherein the acknowledgement number stored

  in the delegated connection table is updated to be a larger one of the

sequence number stored in the delegated connection table and an

acknowledgement number received from the TCP stack.

(Note: FIG. 4, reference character (153-2) in Aviani)

The Examiner notes the sequence number update from X2 to X2+N1

4.   In regard to claim 4, Aviani teaches:

-     (Currently Amended): The method of claim 3, wherein the transmit

sequence number is equal to a sequence number received from the

TCP stack if the sequence number received from the TCP stack is

greater than the sequence number stored in the delegated connection

table.

(Note: FIG. 5 in Aviani)

5.   In regard to claim 5, Aviani teaches:

-     (Currently Amended): The method of claim 3, wherein the sequence

number stored in the delegated connection table is updated as the

acknowledgement number received from the TCP stack if the

acknowledgement number received from the TCP stack is greater than

the sequence number stored in the delegated connection table.

(Note: FIG. 4, reference characters (190)-(194) in Aviani)

6.   In regard to claim 9, Aviani teaches:

-     (Original): The method of claim 1, further comprising computing an

IPv4 header checksum when a delegated connection is an IPv4-based

connection.

(Note: col. 1, lines (44-45) in Aviani)

7.   Claim 22 is rejected for the same reasons as per claim 1.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1.   Determining the scope and contents of the prior art.
2.   Ascertaining the differences between the prior art and the claims at issue.
3.   Resolving the level of ordinary skill in the pertinent art.
4.   Considering objective evidence present in the application indicating obviousness or nonobviousness.

8.   Claims 26-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Aviani as applied to claim 1 above, and further in view of Connery et al. US

patent no. 5937169 (Hereinafter Connery).

9.   In regard to claim 26, Aviani teaches substantially all the limitations in claim 1.

However, Aviani does not teach:

-       (Previously presented): The method of claim 1 wherein connections

        that are not delegated to the offload unit or that require special

        processing are processed by the TCP stack; and

- the offload unit may request legacy processing of one of the delegated connections by the TCP stack so that outgoing frames are transmitted by either the TCP stack or the offload connection.

Connery in an analogous art that teaches offload of TCP segmentation to a smart Adapter teaches:

- (Previously presented): The method of claim 1 wherein connections that are not delegated to the offload unit or that require special processing are processed by the TCP stack; and

(Note: FIG. 5, reference character (202)

- the offload unit may request legacy processing of one of the delegated connections by the TCP stack so that outgoing frames are transmitted by either the TCP stack or the offload connection.

(Note: FIG. 5, reference characters (205)-(209) and col. 13, lines (24-60) in Connery)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Connery that comprise a process for selective offloading higher protocol layer processing such as TCP/IP processing for sending data files onto a smart network interface adaptor with the teaching of Avianti.

This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would

have recognized the need to improve the performance of data processing

systems, by simplifying the higher layer processing, which must be performed by

the host system in order to transmit large quantities of data across data

networks.

10.   In regard to claim 27, Connery teaches:

-      (Previously presented): The method of claim 26 wherein a system

memory is coupled to both the host CPU and the offload unit, and

including the step of storing connection data for all active connections

including those processed at the offload unit and the TCP stack at the

host CPU at a connection table in the system memory.

(Note: FIG. 2, reference character (21) in Connery)

11.   In regard to claim 28, Connery teaches:

-      (Previously presented): The method of claim 26 including the step of

determining that an incoming frame is one of the delegated frames;

and determining the frame type of an incoming delegated frame, an

incoming frame including an IP packet with a TCP segment being

transferred to the TCP stack for processing.

(Note: FIG. 5, reference characters (205)-(209) in Connery)

12.   In regard to claim 29, Connery teaches:

- (Previously presented): The method of claim 26 including the step of determining the validity of an incoming frame and uploading an invalid frame to the TCP stack for legacy processing.

(Note: FIG. 5, reference characters (205)-(209) in Connery)

13.   In regard to claim 30, Connery teaches:

- (Previously presented): The method of claim 27 including the step of processing a valid frame at the offload unit and loading the processed frame directly to the system memory associated with the connection table.

(Note: FIG. 1, reference characters (14)-(15) and FIG. 2, reference character (26) in Connery)

14.   In regard to claim 31, Connery teaches:

- (Previously presented): The method of claim 30 wherein a valid frame is partially processed at the offload unit when user buffer space associated with the offload unit is available, the valid frame being transferred to the TCP stack for legacy processing when user buffer space is not available.

(Note: FIG. 2, reference characters (250, (26) and (28) in Connery)

15.   In regard to claim 32, Connery teaches:

- (Previously presented): The method of claim 31, wherein a portion of the valid frame processed at the offload unit is limited by a startup limit stored at the delegated connection table.

(Note: col. 9, lines (1-27) in Connery)

16. In regard to claim 33, Connery teaches;

- (Previously presented): The method of claim 30, wherein each incoming frame includes an acknowledgement (ACK), the offload unit coalescing a plurality of the ACK's before notifying the TCP stack of the status of the delegated connection associated with each received ACK.

(Note: col. 9, lines (10-19) in Connery)

17. In regard to claim 34, Aviani teaches:

- (Previously presented): The method of claim 1, wherein the offload unit compares a sequence number (SN) in each of the incoming frames with a SN stored in the delegated connection table; and

- if not equal then the entire frame is uploaded for legacy processing by the TCP stack.

(Note: FIG. 4, reference character "SEQ" in (151-1) – (155-3) in Aviani)

Allowable Subject Matter

18.   Claim 6 is objected to as being dependent upon a rejected base claim, but would

be allowable if rewritten in independent form including all of the limitations of the

base claim and any intervening claims.

REASONS FOR ALLOWANCE

The following is an examiner's statement of reasons for allowance:

19.   The prior Art of record and, in particular Aviani does not teach, suggest, or

otherwise render obvious the recited limitation in claim 6:

-    (Currently Amended): The method of claim 1, wherein the frame

includes a TCP timestamp, and the TCP timestamp is <u>equal to a TCP</u>

<u>timestamp received from the TCP stack if the TCP timestamp received</u>

<u>from the TCP stack is greater than a **TCP timestamp stored in the**</u>

delegated connection table.

The Examiner notes that Aviani does not teach or suggest storing the TCP

timestamp in the connection table as a variable for editing inbound and

outbound TCP stack.

20.   Claim 23 is object to for the same reasons as per claim 6.

21.   Claims 13-15 and 35 are allowed.

22.   The prior Art of record and, in particular Aviani does not teach, suggest, or

otherwise render obvious the recited limitation in claim 13:

- (Currently Amended):A method of processing inbound and outbound frames using an offload unit having a delegated connection table, comprising:

- initializing an entry in the delegated connection table with connection state data including a connection table index corresponding to a connection selected by a TCP stack executed by a host CPU for processing by the offload unit, and a count of unacknowledged frames;

- receiving an inbound TCP frame from a destination connection;

- determining that the destination connection is a connection delegated for processing by the offload unit;

- determining whether a sequence number in the TCP frame is consecutive relative to a sequence number stored in a delegated connection table;

- processing the inbound frame at the offload unit and incrementing the count of unacknowledged frames stored in the delegated connection table; updating the sequence number stored in the delegated connection table; and if the count of unacknowledged frames stored in the delegated connection table is greater than a predefined limit, transmitting a receive data acknowledgement to the destination.

The Examiner notes that Aviani does not teach or suggest updating the sequence number stored in the delegated connection table based on thee count of unacknowledged frames stored in delegated connection table.

23.   Claims 14 and 15 depend from claim 13.

24.   Claim 35 has a similar language as in claim 13.

Conclusion

25.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

-    Starr et al. US patent no. 6996070 teaches TCP/IP offload device with reduced sequential processing.

-    Li et al. US patent no. 6757248 teaches performance enhancement of transmission control protocol (TCP) for wireless network application.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sam Rizk whose telephone number is (571) 272-8191. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jacques Louis-Jacques can be reached on (571) 272-6962. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.
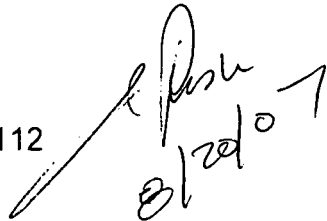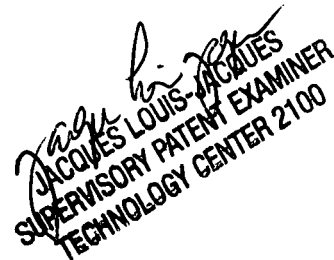
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Sam Rizk,

Examiner

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